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WATER SUPPLY OUTLOOK FOR WESTERN UNITED STATES

Including Columbia River Drainage in Canada



U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
AND
CALIFORNIA DEPARTMENT OF WATER RESOURCES
AND
BRITISH COLUMBIA DEPARTMENT OF
LANDS, FORESTS AND WATER RESOURCES

FEB 23 '76

AS OF
FEB. 1, 1976

U. S. DEPARTMENT of AGRICULTURE ★ SOIL CONSERVATION SERVICE

Collaborating with
CALIFORNIA DEPARTMENT of WATER RESOURCES
and
BRITISH COLUMBIA DEPARTMENT of
LANDS, FORESTS and WATER RESOURCES

TO RECIPIENTS OF WATER SUPPLY OUTLOOK REPORTS:

Most of the usable water in western states originates as mountain snowfall. This snowfall accumulates during the winter and spring, several months before the snow melts and appears as streamflow. Since the runoff from precipitation as snow is delayed, estimates of snowmelt runoff can be made well in advance of its occurrence. Streamflow forecasts published in this report are based principally on measurement of the water equivalent of the mountain snowpack.

Forecasts become more accurate as more of the data affecting runoff are measured. All forecasts assume that climatic factors during the remainder of the snow accumulation and melt season will interact with a resultant average effect on runoff. Early season forecasts are therefore subject to a greater change than those made on later dates.

The snow course measurement is obtained by sampling snow depth and water equivalent at surveyed and marked locations in mountain areas. A total of about ten samples are taken at each location. The average of these are reported as snow depth and water equivalent. These measurements are repeated in the same location near the same dates each year.

Snow surveys are made monthly or semi-monthly from January 1 through June 1 in most states. There are about 1900 snow courses in Western United States and in the Columbia Basin in British Columbia. Networks of automatic snow water equivalent and related data sensing devices, along with radio telemetry are expanding and will provide a continuous record of snow water and other parameters at key locations.

Detailed data on snow course and soil moisture measurements are presented in state and local reports. Other data on reservoir storage, summaries of precipitation, current streamflow, and soil moisture conditions at valley elevations are also included. The report for Western United States presents a broad picture of water supply outlook conditions, including selected streamflow forecasts, summary of snow accumulation to date, and storage in larger reservoirs.

Snow survey and soil moisture data for the period of record are published by the Soil Conservation Service by states about every five years. Data for the current year is summarized in a West-wide basic data summary and published about October 1 of each year.

*COVER PHOTO: SURVEYOR ENROUTE TO THE MT. BALDY ARIZONA SNOW COURSE
SCS PHOTO AZ-5460*

PUBLISHED BY SOIL CONSERVATION SERVICE

The Soil Conservation Service publishes reports following the principal snow survey dates from January 1 through June 1 in cooperation with state water administrators, agricultural experiment stations and others. Copies of the reports for Western United States and all state reports may be obtained from Soil Conservation Service, West Technical Service Center, Room 111, 511 N.W. Broadway, Portland, Oregon 97209.

Copies of state and local reports may also be obtained from state offices of the Soil Conservation Service in the following states:

STATE	ADDRESS
Alaska	204 E. 5th. Ave., Room 217, Anchorage, Alaska 99501
Arizona	6029 Federal Building, Phoenix, Arizona 85025
Colorado (N. Mex.)	P. O. Box 17107, Denver, Colorado 80217
Idaho	Room 345, 304 N. 8th. St., Boise, Idaho 83702
Montana	P. O. Box 98, Bozeman, Montana 59715
Nevada	P. O. Box 4850, Reno Nevada 89505
Oregon	1220 S.W. Third Ave., Portland, Oregon 97204
Utah	4012 Federal Bldg., 125 South State St., Salt Lake City, Utah 84138
Washington	360 U.S. Court House, Spokane, Washington 99201
Wyoming	P. O. Box 2440, Casper, Wyoming 82601

PUBLISHED BY OTHER AGENCIES

Water Supply Outlook reports prepared by other agencies include a report for California by the Water Supply Forecast and Snow Surveys Unit, California Department of Water Resources, P. O. Box 388, Sacramento, California 95802 --- and for British Columbia by the Department of Lands, Forests and Water Resources, Water Resources Service, Parliament Building, Victoria, British Columbia



WATER SUPPLY OUTLOOK FOR WESTERN UNITED STATES Including Columbia River Drainage in Canada

ISSUED

FEBRUARY 1, 1976

The Soil Conservation Service coordinates snow surveys conducted by its staff and many cooperators, including the Bureau of Reclamation, Corps of Engineers, Forest Service, National Park Service, NOAA, National Weather Service, Geological Survey, and other Federal Agencies, Departments of State Government, Irrigation Districts, Power Companies, and others.

The Department of Water Resources coordinates snow surveys in California.

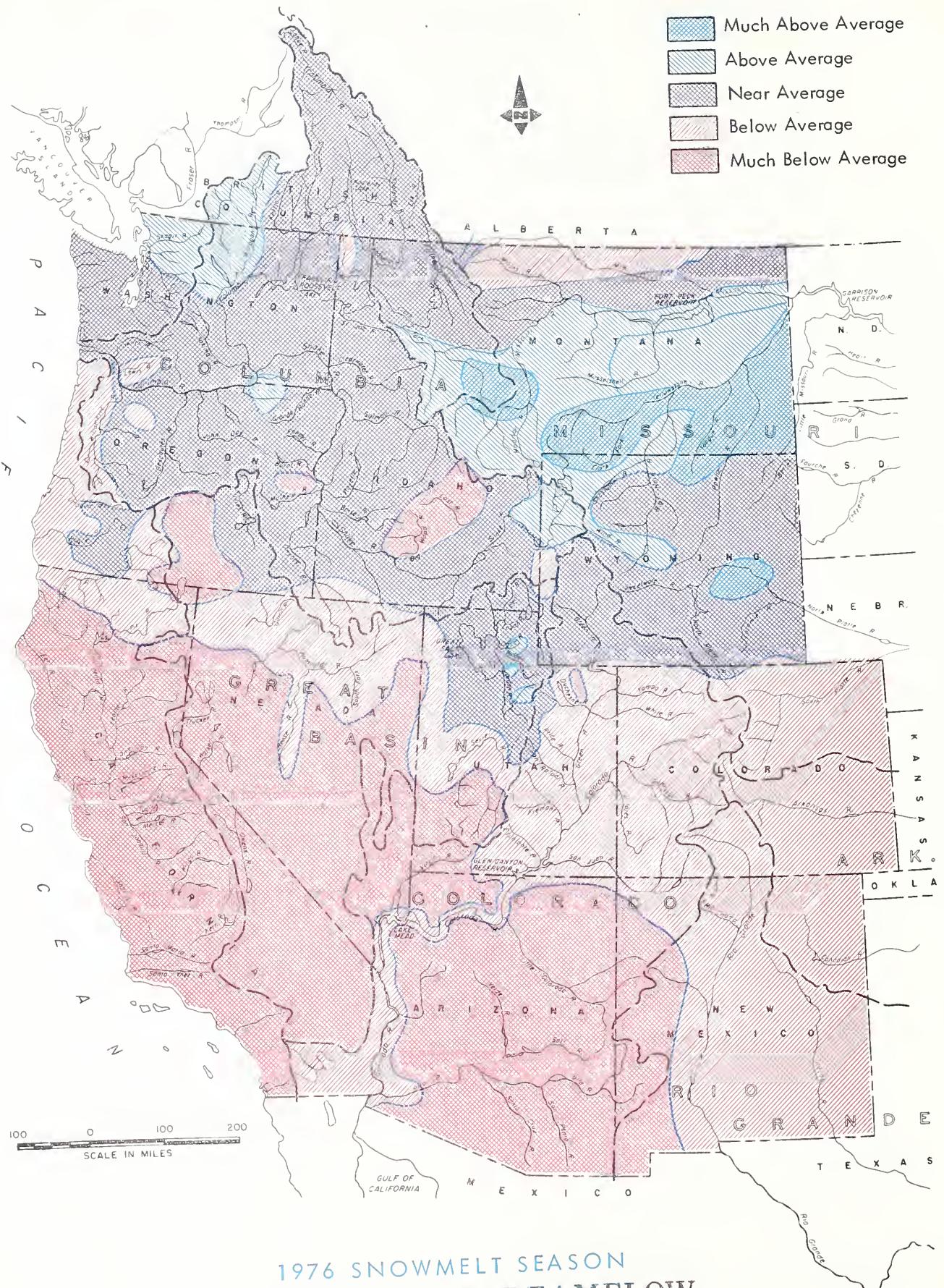
The Water Resources Service, Department of Lands, Forests, and Water Resources directs snow surveys in British Columbia.

This report was prepared by the Water Supply Forecasting Unit, Engineering Division, Soil Conservation Service, from data supplied by Snow Survey Supervisors of the Soil Conservation Service in the States of Alaska, Arizona, Colorado and New Mexico, Idaho, Montana, Nevada, Oregon, Utah, Washington, and Wyoming.

Data from California was supplied by the Chief, Water Supply Forecast and Snow Survey Unit, Department of Water Resources.

Data from British Columbia was supplied by the Chief, Hydrology Division, Water Investigations Branch, Department of Lands, Forests and Water Resources.

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
R.M. DAVIS, ADMINISTRATOR



WATER SUPPLY OUTLOOK

1976 SNOWMELT SEASON
FEBRUARY 1, 1976

THE WATER SUPPLY OUTLOOK IS FAIR IN THE SOUTHERN PORTION OF THE WESTERN STATES, AND GOOD OVER MOST OF THE NORTHWEST. RESERVOIR STORAGE IS GOOD TO EXCELLENT AND WILL EASE THE SHORTAGES IN SOME RUNOFF DEFICIENT AREAS. CALIFORNIA, NEVADA AND ARIZONA WATER USERS MAY EXPERIENCE SHORTAGES WHERE CARRYOVER RESERVOIR STORAGE IS NOT AVAILABLE.

Snowpack conditions throughout the west generally are poorer in the southern regions and better in the north. South of a line from the California-Oregon border extending eastward to the Colorado-Wyoming border the accumulated snowpack is below the February 1 normal. In the Sierra Nevada the snowpack is one of the lowest on record.

To the north of that line the snowpack is normal or above with heavy accumulations in portions of Southwestern Montana and Northwest Wyoming. Water supplies in this region will be average or above in most watersheds.

The British Columbia Water Resources Service, Department of Lands, Forests and Water Resources, reports that the snowpack on the upper Columbia River and its tributaries is above normal, except on the Kootenai River where below average amounts were measured. Snowmelt runoff should equal or exceed the 15-year average from most streams in this vicinity.

The upper Snake River is expected to flow at a rate above average, however, most central Idaho rivers flowing into the Snake are forecast to be under their norm. The Big Wood and Big Lost Rivers are expected to discharge snowmelt runoff at a rate of only two-thirds of average. The lower Columbia River is forecast to yield an average quantity, with most tributary streams also flowing at their normal rates.

Runoff in the upper Missouri Basin is forecast to be 10 to 20 percent above average in most drainages south of the main stem. To the north, the Milk and Maria Rivers are expected to be below normal. The Yellowstone River watershed has one of the heavier snowpacks and snowmelt runoff will be well above average.

The North and South Platte Rivers both have snowpacks slightly above normal. Runoff from several central Wyoming streams is expected to reach twice the normal volumes. Elsewhere in the area streamflows will be within 10 to 15 percent of normal spring and summer rates.

Below average snowpacks have accumulated on the headwaters of the Arkansas and Rio Grande river basins. Snowmelt runoff yields will be less than normal, however, reservoir storage along both river systems is good and will help supplement the below average flows.

The Upper Colorado-Green River watersheds have near average snowpacks and forecasts of snowmelt runoff are near the 15-year normal. Conditions get progressively drier downstream in the basin. Inflow to Lake Powell is forecast to be only 81 percent of the April-July average. However, there is currently 238 percent of the normal storage in the reservoir, so irrigation supplies will be near normal.

In the Great Basin of Utah and Nevada the snowpack is quite variable. The streams flowing from the east slope of the Sierra Nevada will yield much less than their normal rates. In Utah, however, the Weber river basin has 107 percent of its usual February 1 snowpack.

The California Department of Water Resources reports that water supply potentials are only fair at this time. Some economic loss to agriculture was experienced during January due to insufficient precipitation during the last three months. However, no major water supply deficiencies are foreseen where users have access to carryover reservoir storage, which was about normal on February 1 throughout the state.

MISSOURI BASIN

Snow cover is quite variable ranging from below average along the Montana-Idaho border in the Red Rock River drainage and in the Marias River headwaters to near record amounts along the Continental Divide

SUMMARY OF SNOW WATER EQUIVALENT MEASUREMENTS

MAJOR BASIN AND SUB - WATERSHED	WATER EQUIVALENT IN PERCENT OF: LAST YEAR	AVERAGE	MAJOR BASIN AND SUB - WATERSHED	WATER EQUIVALENT IN PERCENT OF: LAST YEAR	AVERAGE
MISSOURI BASIN			SNAKE BASIN		
Jefferson	123	114	Snake above Jackson, Wyo.	167	134
Madison	151	120	Snake above Hiese, Idaho	149	125
Gallatin	120	118	Snake abv. American Falls Res.		
Missouri Main Stem	108	112	Henry's Fork	160	108
Yellowstone	147	126	Southern Idaho Tributaries	90	100
Shoshone	145	164	Big and Little Wood	115	68
Wind	120	121	Boise	110	92
North Platte	106	106	Owyhee	60	90
South Platte	89	108	Payette	107	91
ARKANSAS BASIN			Malheur	95	110
Arkansas	84	94	Weiser	99	78
Cucharas-Purgatoire	79	93	Burnt	110	110
RIO GRANDE BASIN			Powder	100	100
Rio Grande (Colo.)	66	71	Salmon	107	95
Rio Grande (New Mexico)	85	94	Grande Ronde	105	110
Pecos	81	120	Clearwater	105	108
COLORADO BASIN			LOWER COLUMBIA BASIN		
Green (Wyo.)	116	105	Yakima	75	86
Yampa - White	82	87	Umatilla	115	135
Duchesne	76	76	John Day	110	105
Price	95	96	Deschutes - Crooked	102	112
Upper Colorado	87	94	Hood	105	95
Gunnison	76	81	Willamette	110	105
San Juan	64	69	Lewis	84	60
Dolores	78	87	Cowlitz	80	79
Virgin	65	46	PACIFIC COASTAL BASIN		
Gila	68	52	Puget Sound	89	100
Salt	118	79	Olympic Peninsula	86	70
Verde	122	93	Umpqua - Rogue	85	105
GREAT BASIN			Klamath	100	100
Bear	96	94	Trinity	85	65
Logan	100	91	CALIFORNIA CENTRAL VALLEY		
Ogden	82	82	Upper Sacramento	75	65
Weber	86	107	Feather	65	40
Provo - Utah Lake	94	99	Yuba	65	50
Sevier, Upper	74	52	American	65	50
Sevier, Lower	80	90	Mokelumne	60	40
Walker - Carson	38	22	Stanislaus	55	40
Tahoe - Truckee	40	25	Tuolumne	65	45
Humboldt	77	95	Merced	65	45
Lake Co. (Oregon)	95	75	San Joaquin	65	45
Harney Basin (Oregon)	85	105	Kings	60	45
Owens (California)	25	10	Kaweah	60	40
UPPER COLUMBIA BASIN			Tule	40	15
Columbia (Canada)	103	116	Kern	50	25
Kootenai	89	87	 Data for California Watersheds supplied by Dept. of Water Resources, and for British Columbia Watersheds by Dept. of Lands, Forests and Water Resources.		
Clark Fork	110	112	 Average is for the 1958-72 period. California averages are for the period 1931-70. Based on Selected Snow Courses determined by Distribution within the Basin, Length of Record and Repetitive Monthly Measurement Schedules.		
Bitterroot	107	121			
Flathead	101	91			
Spokane	86	91			
Okanogan	93	107			
Methow	94	92			
Chelan	106	124			
Wenatchee	87	92			

in the vicinity of Butte, Montana. In the Big Horn and Absaroka ranges of Wyoming as well as other portions of the Yellowstone drainage the snowpack has reached near record levels for February 1.

The North Platte snowpack is slightly above normal throughout the watershed. An area of very heavy snowpacks was measured to the north of the Laramie Peak area. The South Platte river basin is also variable, with near average amounts accumulated on the main stem, but only three-fourths of normal on Boulder Creek.

Soil moisture in Montana is generally good while in Colorado the subsurface conditions are poor to fair. This condition will result in more snowmelt water soaking into the soils than is usual in Colorado, whereas losses to the soil in Montana will be near average.

Streamflow forecasts are generally above the 15-year normal in Montana and Wyoming. The Clarks Fork, Shoshone, Yellowstone and Tongue Rivers are forecast to flow at rates well above their averages. However, the Marias and Milk Rivers in Northern Montana are expected to discharge below normal quantities.

The North Platte River is forecast to discharge 90 percent of its norm into Seminoe reservoir. However, storage in Seminoe and Pathfinder reservoirs is excellent, so supplies should be adequate during the irrigation season. Additionally, some downstream tributaries are heavily snowladen and expected to flow at nearly double their usual rates. Most other streams in the Wyoming portion of the Missouri drainage are forecast to yield within 10 percent of their average amounts.

Reservoir storage is excellent. In Montana the impounded water as of the last of January was about 130 percent of normal. In Wyoming the storage on the Wind River was 106 percent of average and the North Platte system contained 170 percent of its average. The South Platte reservoirs held 105 percent of their normal amount.

ARKANSAS BASIN

Snowpack conditions throughout the basin are only slightly below the 15-year average, currently standing at 95 percent of the February 1 normal. The Cucharas and

Purgatoire drainages have about the same snow conditions as the main stem of the Arkansas.

Warm dry conditions in the valleys have resulted in relatively dry soil moisture conditions. Reservoir storage is also poor. John Martin is nearly empty, while Conchas reservoir contains only 45 percent of its normal for this date.

Above normal precipitation during the second half of the snow accumulation season will be necessary if the spring and summer water supply is to be near average.

RIO GRANDE BASIN

The Rio Grande basin snowpack is generally below normal. On the headwaters in Southern Colorado the current accumulation is only 71 percent of average, while in Northern New Mexico the pack is just slightly below average. The Red River and Pecos drainages are notable exceptions, however, with above normal snow. On the Red River the February 1 snowpack is 40 percent above normal.

Soil moisture is only fair, and with a below normal snowpack, spring and summer water supplies could be short unless storms are heavier than usual during the remainder of the winter.

Reservoir storage is good, however, with Elephant Butte impounding 155 percent of its usual February 1 quantity and other reservoirs in the system with a combined figure of 280 percent of average.

COLORADO BASIN

Over the entire Colorado basin the snowpack is about 90 percent of the February 1 normal. The Green River in Wyoming has the best snow condition, with 105 percent of average. Elsewhere the snowpack is quite variable, with light accumulations on the Duchesne and Virgin Rivers in Utah where the current pack is 76 and 46 percent of normal, respectively. Other low snow areas include the San Juan drainage in Colorado and the Gila in Arizona with 69 and 52 percent of average.

The Green and Little Snake Rivers flowing out of Wyoming and Colorado are about the

SELECTED STREAMFLOW FORECASTS FEBRUARY 1, 1976

STREAM AND STATION	FORECASTS THIS YEAR		Forecast Period	Last Year's Flow In (1,000 A.F.)
	Flow In (1,000 A.F.)	Percent of Average		
SASKATCHEWAN				
St. Mary near Babb, Montana 1/	475	97	April-Sept.	
UPPER MISSOURI				
Beaverhead near Grant, Montana 2/	167	115	April-Sept.	295
Big Hole near Melrose, Montana	950	127	April-Sept.	
Madison near Grayling, Montana 3/	560	117	April-Sent.	529
Gallatin near Gateway, Montana	630	119	April-Sept.	
Sun at Gibson Dam, Montana 4/	545	92	April-Sept.	829
Belt near Monarch, Montana	152	122	April-Sept.	122
Marias near Shelby, Montana 5/	500	89	April-Sept.	
Missouri near Landusky, Montana 6/	5,450	115	April-Sept.	
near Williston, North Dakota 7/	14,800	126	April-Sept.	
S. Fk. Musselshell above Martinsdale, Montana	58	116	April-Sept.	
Milk at Eastern Crossing, Montana	235	82	March-Sept.	
Yellowstone at Yellowstone Lake Outlet, Wyo.	995	121	April-Oct.	844
at Corwin Springs, Montana	2,600	130	April-Sent.	
at Miles City, Montana 8/	8,200	129	April-Sept.	2,159
Clarks Fork near Belfry, Montana	840	138	April-Sept.	
Shoshone below Buffalo Bill Res., Wyo. 9/	1,020	133	April-Sept.	917
Wind near Dubois, Wyoming	130	127	April-Sept.	
at Riverton, Wyoming 10/	800	120	April-Sept.	
below Boysen Res., Wyoming 11/	1,120	111	April-Sept.	
Bull Lake Creek near Lenore, Wyoming	190	104	April-Sept.	
Little Popo Agie near Lander, Wyoming	47	99	April-Sept.	
Tensleep near Tensleep, Wyoming	72	91	April-Sept.	
Medicine Lodge near Hyattville, Wyoming	22	104	April-Sept.	
Shell Creek near Shell, Wyoming	90	123	April-Sept.	
Big Horn near St. Xavier 8/	2,150	116	April-Sept.	2,497
Tongue near Dayton, Wyoming	150	133	April-Sept.	176
No. Fork Powder near Hazelton, Wyoming	12	120	April-Sept.	15
PLATTE				
North Platte at Sinclair, Wyoming	580	90	April-Sept.	789
Encampment near Encampment, Wyoming	135	96	April-Sept.	192
Laramie & Pioneer Canal, nr Woods, Wyo. 12/	118	93	April-Sept.	124
Big Thompson at Drake, Colorado 13/			April-Sept.	
Clear at Golden, Colorado 14/			April-Sept.	
St. Vrain at Lyons, Colorado 15/			April-Sept.	
Cache LaPoudre near Fort Collins, Colorado 16/			April-Sept.	
ARKANSAS				
Arkansas at Salida, Colorado 17/			April-Sept.	
Cucharas near LaVeta, Colorado			April-Sept.	
Purgatoire at Trinidad, Colorado			April-Sept.	
RIO GRANDE				
Rio Grande near Del Norte, Colorado 18/			April-Sept.	
at Otowi Bridge, New Mexico 19/			March-July	
Conejos near Mogote, Colorado 20/			April-Sept.	
El Vado Res., Inflow, New Mexico			March-July	
Pecos at Pecos, New Mexico			March-July	
UPPER COLORADO				
Colorado, Grandby Res., Inflow, Colorado 21/			April-Sept.	
near Dotsero, Colorado 22/			April-Sept.	
near Cameo, Colorado 23/			April-Sept.	
near Cisco, Utah 24/	2,125	75	April-July	4,038
Lake Powell Inflow, Arizona 25/	5,596	81	April-July	10,407
Roaring Fork at Glenwood Springs, Colorado 26/			April-Sept.	
Uncompahgre at Colona, Colorado			April-Sept.	
Gunnison, Blue Mesa Res. Inflow, Colorado 27/			April-Sept.	

Forecasts in California provided by Department of Water Resources.
 Average is for 1958-72 period except California. California is computed for 1921-70 period.
 Forecasts assume average Effective Climate Conditions from Date Through Snow Melt Season.

Explanatory Notes on Forecasts listed on Inside Back Cover.

SELECTED STREAMFLOW FORECASTS FEBRUARY 1, 1976

STREAM AND STATION	FORECASTS THIS YEAR		Forecast Period	Last Year's Flow In (1,000 A.F.)
	Flow In (1,000 A.F.)	Percent of Average		
UPPER COLORADO (continued)				
Gunnison, near Grand Junction, Colorado <u>28/</u>			April-Sept.	
Dolores at Dolores, Colorado			April-Sept.	
Green at Warren Bridge, Wyoming	345	106	April-Sept.	335
at Green River, Wyoming <u>29/</u>	1,065	108	April-Sept.	1,167
Flaming Gorge Res. Inflow, Utah <u>27/</u>	1,204	103	April-July	1,635
at Green River, Utah <u>30/</u>	2,574	91	April-July	4,082
Big Sandy near Big Sandy, Wyoming	51	89	April-Sept.	72
Yampa at Steamboat Springs, Colorado			April-Sept.	
near Maybell, Colorado			April-Sept.	
Little Snake near Dixon, Wyoming	330	110	April-Sept.	
White near Meeker, Colorado			April-Sept.	
Strawberry at Duchesne, Utah <u>40/</u>	52	93	April-July	65
Duchesne near Tabiona, Utah <u>31/</u>	80	77	April-July	
at Randlett, Utah <u>40/</u>	150	68	April-July	
Lakefork below Moon Lake, Utah <u>32/</u>	50	72	April-July	82
Uinta near Neola, Utah	54	61	April-July	99
Whiterocks near Whiterocks, Utah	37	64	April-July	79
Price, Scofield Res. Inflow, Utah <u>33/</u>	34	100	April-July	
Cottonwood near Orangeville, Utah <u>34/</u>	42	91	April-July	
San Juan, Navajo Res. Inflow, New Mexico <u>27/</u>	450	75	April-July	
near Bluff, Utah <u>35/</u>	651	78	April-July	
Animas at Durango, Colorado			April-Sept.	
LOWER COLORADO				
Virgin near Virgin, Utah	27	56	April-June	46
Little Colorado above Lyman, Arizona	6	49	January-June	17
Gila near Solomon, Arizona	50	32	January-May	
Frisco at Clifton, Arizona	25	32	January-May	
Salt at Intake, Arizona	142	44	January-Mav	442
Tonto above Roosevelt, Arizona	8	17	January-May	46
Verde above Horseshoe Dam, Arizona	116	61	January-Mav	183
GREAT BASIN				
Bear at Utah-Wyo. State Line	108	97	April-July	140
at Harer, Idaho	230	85	April-Sept.	
Smith's Fork near Border, Wyoming	104	90	April-Sept.	134
Thomas Fork near Wyo.-Ida. State Line	27	83	April-Sept.	42
Logan near Logan, Utah <u>36/</u>	113	100	April-July	140
Ogden, Pine View Res. Inflow, Utah <u>27/</u>	114	104	April-June	176
Weber near Oakley, Utah	98	98	April-June	104
Provo near Hailstone, Utah <u>37/</u>	100	98	April-June	
Strawberry Res. Inflow, Utah	53	118	April-June	
Utah Lake Net Inflow, Utah	215	103	April-July	
Big Cottonwood near Salt Lake City, Utah	37	103	April-July	
Beaver near Beaver, Utah	14	68	April-July	18
Sevier near Hatch, Utah	22	54	April-July	35
near Gunnison, Utah	32	82	April-July	55
So. Fork Humboldt near Elko, Nevada				
Humboldt at Palisades, Nevada			April-July	475
Truckee at Farad, California <u>38/</u>				
East Carson near Gardnerville, Nevada				
West Walker near Coleville, California	100	69	April-July	184
Donner und Blitzen near Frenchglen, Oregon	54	98	March-July	
Silvies near Burns, Oregon	93	99	March-July	
Chewaucan near Paisley, Oregon	62	71	March-July	98
Deep above Adel, Oregon	47	60	March-July	
Bidwell near Ft. Bidwell, California				
Owens below Long Valley Res., California	28	45	April-July	56
West Carson at Woodsfords, California				
East Walker near Bridgeport, California <u>39/</u>				

Forecasts in California provided by Department of Water Resources.

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Forecasts assume average Effective Climate Conditions from Date Through Snow Melt Season.

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SELECTED STREAMFLOW FORECASTS FEBRUARY 1, 1976

STREAM AND STATION	FORECASTS THIS YEAR		Forecast Period	Last Year's Flow In (1,000 A.F.)
	Flow In (1,000 A.F.)	Percent of Average		
UPPER COLUMBIA				
Columbia at Birchbank, British Columbia 40/	46,500	100	April-Sept.	41,188
at Grand Coulee, Washington 40/	71,200	103	April-Sept.	66,512
below Rock Island, Washington	78,300	104	April-Sept.	74,143
Kootenai near Libby, Montana	7,150	96	April-Sept.	6,388
at Leonia, Idaho	8,900	98	April-Sept.	8,093
Blackfoot near Bonner, Montana	1,300	126	April-Sept.	1,371
So. Fk. Flathead nr Columbia Falls, Montana 40/	2,200	92	April-Sept.	2,520
Flathead at Columbia Falls, Montana 40/	5,850	91	April-Sept.	6,794
near Polson, Montana 40/	7,050	92	April-Sept.	7,895
Clark Fork above Missoula, Montana	2,300	126	April-Sept.	2,722
near Plains, Montana 40/	13,000	103	April-Sept.	14,101
at Whitehorse Rapids, Idaho	14,400	102	April-Sept.	
Bitterroot near Darby, Montana	750	128	April-Sept.	736
Priest near Priest River, Idaho				
Pend Oreille below Box Canyon, Washington	16,500	103	April-Sept.	17,559
Kettle near Laurier, Washington	2,050	109	April-Sept.	1,921
Spokane at Post Falls, Idaho	2,700	90	April-Sept.	
Similkameen near Nighthawk, Washington	1,740	115	April-Sept.	1,409
Okanogan near Tonasket, Washington	2,070	120	April-Sept.	1,584
Methow near Pateros, Washington	1,240	120	April-Sept.	
Stehokin at Stehokin, Washington	975	108	April-Sept.	
Chelan at Chelan, Washington 43/	1,430	114	April-Sept.	1,368
Wenatchee at Peshastin, Washington	2,090	117	April-Sept.	2,000
SNAKE				
Snake above Palisades Res., Wyoming 44/	3,200	122	April-Sept.	2,838
near Heise, Idaho 45/	4,200	106	April-Sept.	
near Blackfoot 46/				
at Weiser, Idaho				
Grey's above Palisade, Wyoming	358	92	April-Sept.	424
Salt above Palisade, Wyoming	305	84	April-Sept.	524
Henry's Fork near Ashton, Idaho 47/				
Teton near St. Anthony, Idaho				
Blackfoot Reservoir Inflow, Idaho				
Big Lost near MacKay, Idaho 48/	125	68	April-Sept.	
Portneuf at Topaz, Idaho				
Salmon Falls Creek nr San Jacinto, Idaho				
Big Wood, Inflow to Magic Res., Idaho 49/	200	66	April-Sept.	
Bruneau near Hot Springs, Idaho				
Boise near Boise, Idaho 50/	1,550	96	April-Sept.	
Owyhee near Owyhee, Nevada 51/	58	85	April-July	144
Owyhee Res. Net Inflow, Oregon 27/	460	90	Feb.-July	1,109
Malheur near Drewsey, Oregon	102	93	Feb.-July	
Payette near Horseshoe Bend, Idaho 52/			April-Sept.	
Weiser above Crane Creek, Idaho 40/				
Burnt near Hereford, Oregon 40/	49	103	Feb.-July	
Powder near Sumpter, Oregon	51	94	April-July	
Eagle above Skull Creek, Oregon	178	102	April-July	
Imnaha at Imaha, Oregon	292	95	April-Sept.	
Salmon at Whitebird, Idaho	6,900	99	April-Sept.	
Lostine near Lostine, Oregon	121	97	April-Sept.	
Grand Ronde at LaGrande, Oregon	205	104	March-Sept.	306
Clearwater at Spalding, Idaho	8,900	103	April-Sept.	
LOWER COLUMBIA				
Yakima at CleElum, Washington 53/	1,000	103	April-Sept.	
near Parker, Washington 54/	1,760	102	April-Sept.	
Naches near Naches, Washington 55/	900	101	April-Sept.	
Walla Walla, So. Fk. near Milton, Oregon	80	101	March-Sept.	

Forecasts in California provided by Department of Water Resources.
 Average is for 1958-72 period except California. California is computed for 1921-70 period.
 Forecasts assume average Effective Climate Conditions from Date Through Snow Melt Season.

Explanatory Notes on Forecasts listed on Inside Back Cover.

SELECTED STREAMFLOW FORECASTS FEBRUARY 1, 1976

STREAM AND STATION	FORECASTS THIS YEAR		Forecast Period	Last Year's Flow In (1,000 A.F.)
	Flow In (1,000 A.F.)	Percent of Average		
LOWER COLUMBIA (continued)				
Umatilla at Pendleton, Oregon	216	108	March-Sept.	
John Day, Middle Fork at Ritter, Oregon	126	98	April-Sept.	
North Fork at Monument, Oregon	662	102	March-Sept.	
Crooked near Post, Oregon	148	86	Feb.-Sept.	
Deschutes at Benham Falls, Oregon 40/	382	106	April-July	
Columbia at The Dalles, Oregon 40/	105,200	101	April-Sept.	109,012
at The Dalles, Oregon 40/	89,000	99	April-July	94,328
Hood near Tucker Bridge, Oregon 40/	257	90	April-July	
McKenzie near Vida, Oregon	1,067	103	April-July	
Santiam, South, at Waterloo, Oregon	536	95	April-July	
North, at Mehama, Oregon 40/	765	100	April-July	
Clackamas at Estacada, Oregon	586	87	April-July	
Willamette at Salem, Oregon 40/	4,660	106	April-July	
Lewis at Ariel, Washington 56/	1,180	88	April-Sept.	1,196
Cowlitz at Castle Rock, Washington 57/	2,910	105	April-Sept.	2,652
NORTH PACIFIC COASTAL				
Dungeness near Sequim, Washington	161	98	April-Sept.	
Umpqua, No., near Toketee Falls, Oregon 40/	175	109	April-Sept.	
Rogue at Raygold, Oregon	943	106	April-Sept.	1,209
Klamath Lake, Net Inflow, Oregon	764	85	Feb.-Sept.	1,134
Trinity at Lewiston, California	410	66	April-July	895
CALIFORNIA CENTRAL VALLEY 40/				
Sacramento, Inflow to Shasta, California	1,385	78	April-July	2,369
Feather near Oroville, California	960	52	April-July	2,634
Yuba at Smartville, California	420	39	April-July	1,378
American, Inflow to Folsom Res., Calif.	420	32	April-July	1,648
Cosumnes at Michigan Bar, California	50	38	April-July	191
Mokelumne, Inflow to Pardee Res., Calif.	195	42	April-July	605
Stanislaus, Inflow to Melones Res., Calif.	290	40	April-July	932
Tuolumne, Inflow to Don Pedro Res., Calif.	520	42	April-July	1,490
Merced, Inflow to Excheque Res., Calif.	270	44	April-July	817
San Joaquin, Inflow to Millerton Lake, Calif.	505	42	April-July	1,413
Kings, Inflow to Pine Flat Res., California	540	46	April-July	1,266
Kaweah, Inflow to Terminus Res., California	120	44	April-July	296
Tule, Inflow to Success Res., California	16	27	April-July	67
Kern, Inflow to Isabella Res., California	115	27	April-July	368
ALASKA				
Yukon at Eagle, Alaska			April-July	
at Ruby, Alaska			April-July	
Porcupine near Ft. Yukon, Alaska			April-July	
Salcha near Salchaket, Alaska			April-July	
Little Chena near Fairbanks, Alaska			April-July	
Chena at Fairbanks, Alaska			April-July	
Ship Creek near Anchorage, Alaska			April-July	
So. Fk. Campbell Cr. near Anchorage, Alaska			April-July	

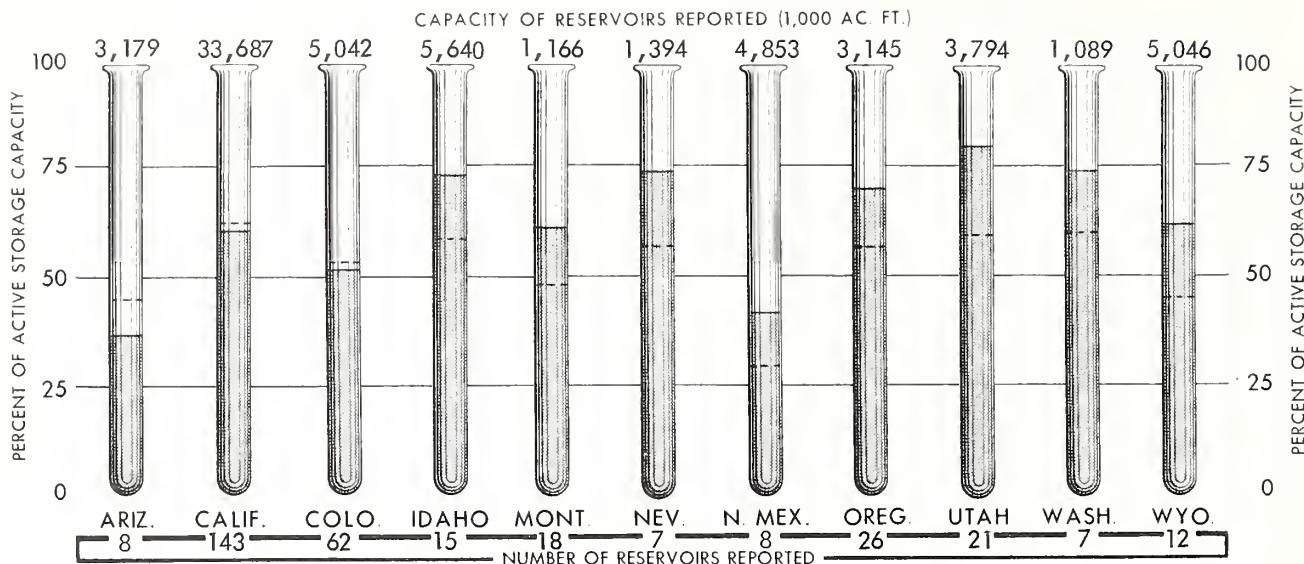
Forecasts in California provided by Department of Water Resources.
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Explanatory Notes on Forecasts listed on Inside Back Cover.

RESERVOIR STORAGE as of

February 1, 1976

... AVERAGE
THIS YEAR



only streams expected to be above normal during the snowmelt period. The Green is forecast to discharge 103 percent of its average into Flaming Gorge reservoir and the Little Snake is predicted to flow at 110 percent.

Elsewhere on the Upper Colorado streamflow amounts will be quite variable but generally below normal. In Utah the Duchesne is expected to yield 68 percent at Randlett. The Uinta and Whiterocks forecasts are 61 and 64 percent of normal, respectively. The San Juan river is forecast at 78 percent. The expected Colorado River inflow to Lake Powell is 81 percent of the 15-year average. However, current storage in the reservoir is excellent, as it now holds 238 percent of its normal contents.

Flows into the lower portion of the basin currently are forecast to be much below normal. The Salt, Verde, and Tonto combined flow for the January-May period is predicted to be only half the normal amount. The Little Colorado is also forecast to discharge only 50 percent of its average, while the Upper Gila is expected to flow at only one-third its normal rate.

Most reservoirs in the basin are at normal levels or above. The most notable exception is on the Verde River where the impoundments are only 21 percent of average. Salt River project reservoirs are currently at 93 percent of their normal February 1 levels.

GREAT BASIN

February 1 snow surveys revealed that the snowpack in the Sierra Nevada was one of the lightest on record. At Donner Summit the snowpack has been lighter only once (1963) in the past 54 years. Further east in Nevada and Utah the snowpack is more favorable, with near average conditions on the Humboldt, Provo, and Bear River drainages. There are areas of low snowpack in Utah, however, including the upper Sevier, at 52 percent, and the Ogden drainage which is 82 percent of average.

In Oregon the Lake County region has 75 percent of its normal snowpack, but the Harney Basin currently stands at 105 percent of its average.

Streamflow forecasts for the spring and summer snowmelt period are quite variable. The best outlook is in Utah. Inflows to Strawberry reservoir and Utah Lake are expected to be 118 percent and 103 percent of normal, respectively. Near average amounts are also expected from the upper Bear, Weber, and Provo Rivers. In Oregon normal yields are expected from the Donner and Blitzen and Silvies drainages. Below average runoff is forecast from the Thomas Fork in Wyoming, lower Bear and Sevier Rivers in Utah and the Humboldt of Nevada, all of which should range from 80 to 90 percent.

STORAGE IN LARGE RESERVOIRS FEBRUARY 1, 1976

BASIN AND NAME OF RESERVOIR	CAPACITY (1,000 A.F.)	STORAGE (1,000 A.F.)	STORAGE PERCENT AVERAGE	BASIN AND NAME OF RESERVOIR	CAPACITY (1,000 A.F.)	STORAGE (1,000 A.F.)	STORAGE PERCENT AVERAGE
UPPER MISSOURI							
Belle Fourche	185	94	107	Chelan	676	513	173
Boysen	550	319	110	Coeur d'Alene	225	169	122
Buffalo Bill	373	219	133	Duncan	1,400	597	192
Canyon Ferry	2,043	1,773	108	Flathead	1,791	1,249	100
Fort Peck	19,140	17,540	133	Hungry Horse	3,428	2,768	111
Garrison	24,790	19,443	135	Kootenay	787	619	96
Hebgen	377	288	142	Lake Koocanusa	5,694	2,450	--
Keyhole	192	125	176	Lower Arrow	2,691	1,838	715
Lake Francis Case	5,816	3,145	98	Noxon Rapids	335	304	95
Lake Sharpe	1,900	1,788	104	Pend Oreille	1,155	486	121
Oahe	23,630	18,421	124	Roosevelt	5,232	5,116	144
Tiber	1,347	581	101	Upper Arrow	4,400	2,799	440
Bighorn Lake	1,356	863	110	LOWER COLUMBIA			
PLATTE							
So. Platte in Colo. (30)	1,085	761	105	Cougar	155	9	26
City of Denver (7)	622	481	103	Detroit	300	17	28
Colo-Big Thompson (3)	718	503	120	Green Peter	270	7	10
Glendo	784	352	112	Hills Creek	200	24	62
Pathfinder	1,016	819	240	Lookout Point	337	24	38
Seminoe	1,010	612	156	Prineville	153	93	91
ARKANSAS							
Conchas	273	82	44	SNAKE			
John Martin	354	7	8	American Falls	1,125	931	149
Turquoise	130	52	--	Anderson Ranch	423	277	108
RIO GRANDE							
Elephant Butte	2,195	684	155	Arrowrock	287	278	116
New Mexico Res. (4)	578	199	280	Brownlee			
UPPER COLORADO							
Blue Mesa	830	473	96	Cascade	653	458	134
Flaming Gorge	3,749	3,329	203	Dworshak			
Navajo	1,696	1,130	91	Jackson	847	627	156
Powell	25,002	20,023	238	Lucky Peak	278	64	70
Starvation	165	144	--	Owyhee	715	622	152
LOWER COLORADO							
Havasu	619	543	100	Palisades	1,200	970	124
Mead	26,159	20,276	117	Warm Springs	191	132	164
Mohave	1,810	1,618	97	PACIFIC COASTAL			
Salt River Res. (4)	1,755	1,003	93	Clair Engle	2,448	1,847	91
San Carlos	949	123	72	Clear Lake	440	287	140
Verde River Res. (2)	318	27	21	Nacimiento	350	291	157
GREAT BASIN				Ross	1,053	877	148
Bear	1,421	1,073	114	Upper Klamath	584	326	91
Lahontan	291	205	113	CALIFORNIA CENTRAL VALLEY			
Rye Patch	157	154	179	Almanor	1,308	653	89
Sevier Bridge	236	154	186	Berryessa	1,602	1,348	87
Strawberry	274	241	211	Bullards Bar	961	273	52
Tahoe	732	499	117	Folsom	1,010	538	91
Utah	884	921	164	Isabella	570	170	89
Willard Bay	193	159	144	McClure	1,026	611	114
				Millerton	521	356	91
				Oroville	3,538	2,679	114
				Pine Flat	1,002	481	79
				Shasta	4,552	2,991	88

Reservoir Storage Data Provided by Bureau of Reclamation, Corps of Engineers, Geological Survey, and water using organizations. Data from California and British Columbia provided by Department of Water Resources and Department of Lands, Forests and Water Resources, respectively.

Deep Creek in Oregon is forecast to yield only 60 percent of its normal. The Beaver and upper Sevier River flows are now forecast to be 68 and 54 percent of normal. Streams flowing east from the Sierra Nevada are expected to yield much below normal quantities also. The west Walker and Owens are examples of these predicted low flows, at 69 and 45 percent.

Reservoir storage is good to excellent with carryover amounts as high as double the normal quantities. Water users whose supplies are supplemented by reservoir storage are expected to have adequate irrigation water this summer. Lake Tahoe is currently at 117 percent of normal, while Utah Lake is at 164 percent and Strawberry reservoir is nearly full and double its normal February 1 impoundment.

COLUMBIA BASIN

Early season rain and snow was heavy over much of the Columbia Basin. However, there has been almost no additional snowfall since mid-January. The upper Snake, Blackfoot and Bitterroot drainages in Wyoming and Montana currently have snowpacks well above normal. This condition also prevails in British Columbia on the Similkameen, Okanagan, and Kettle Rivers. The Umatilla River watershed in Oregon has a similarly heavy snowpack.

Some watersheds have light snowpacks, including the Cowlitz, Lewis and Colville Rivers in Washington. The Clackamas River snowpack is only three-fourths its normal amount and the Little Lost and Big Wood River watersheds in Idaho have only about 58 percent of their usual snowpack. Elsewhere within the basin snowpacks are generally near their 15-year average for February 1.

The Columbia River will flow at a rate of 101 percent of its average during the snowmelt period. This represents the combined flows of many streams with variable conditions. The best runoff will occur from the Bitterroot, Okanagan and Methow Rivers which will be in the range of 120 to 130 percent of normal. Most other upper basin rivers will flow at near average rates.

The Big Lost and Big Wood Rivers are forecast to discharge only two-thirds of their normal quantities. Other Idaho streams flowing into the Snake River will range from 90 to 105 percent of their normal flows.

Most lower Columbia tributaries are forecast to be near average. In Oregon, however, the Crooked, Clackamas and Hood Rivers are expected to yield between 85 and 90 percent of their averages. The Lewis River in Washington is also forecast to discharge 12 percent below normal.

Reservoir storage in the upper portion of the basin is very good with most impoundments well above their normal February 1 levels. The reverse is true along the lower river, however, where most reservoirs are below normal for this time of year.

CALIFORNIA

The California Department of Water Resources, coordinating agency for snow surveys and water supply forecasting in California, reports that as of February 1 water supply potentials for 1976 are only fair for most of the state. A three-month winter drought has resulted in some economic loss to cattlemen and dry farm operators. Water demands from surface storage, as well as ground water pumping, have increased as farmers in the Central Valley boosted preirrigation operations to offset lack of rainfall. Surface storage of carryover water supplies is about normal for this date, and no major deficiencies in areas served from these reservoirs are foreseen for 1976. Forecasts of April through July runoff, based on receipt of normal precipitation amounts for the remainder of the winter, now range from a low of 27 percent of normal for the Tule and Kern Rivers to 78 percent of normal for the Upper Sacramento River, inflow to Shasta Lake. Most streams in the Central Valley are forecasted to produce 40 to 60 percent of normal runoff for the April through July period.

Snow survey data shows that the water content of the mountain snowpack was far below average throughout the state on February 1. Snow water content was 50 percent of normal in the Sacramento River hydrographic area and only 40 percent of normal in the San Joaquin Valley watersheds. Statewide, the average is about 45 percent of normal for February 1.

The present snowpack amounts to only 15 percent of the total seasonal accumulation, which usually occurs about April 1. Therefore, should average amounts of snow accumulate during the remainder of the winter season, snow water content by April 1 would

be 50 percent of normal. This means that 250 percent of normal February and March snow accumulation will be needed to reverse the present dry trend and to produce a normal April 1 snowpack thus assuring a normal snowmelt runoff next spring and summer.

Precipitation since the last major storm in October has been far below normal. A high pressure system dominated the weather pattern over California through January and effectively held off the movement of storms into the state. By the end of January many minimum precipitation records had been broken as warm, springlike weather prevailed over valleys and mountains alike. January rainfall was zero throughout Southern California, and reached a high of only 30 percent of normal in the extreme northern part of the state.

Runoff has also been very meager with several streams setting new all-time low records. During January streamflow ranged from almost zero in the San Francisco Bay area to a high of 69 percent of normal in the Lahontan area. The statewide average runoff was about 30 percent of normal for the state. In the Central Valley, runoff for the four-month period has ranged from a low of 22 percent of normal for the Cosumnes River to a high of 69 percent of normal for the inflow to Shasta Lake.

Reservoir storage was near average throughout the state on February 1, based

on reports from operators of 143 reservoirs. In the Sacramento Valley, reservoirs were storing 90 percent of average supplies. San Joaquin Valley reservoirs were storing 105 percent of average contents. Colorado River storage projects, which store supplies for use in Southern California, are now holding almost 140 percent of average contents for this date.

ALASKA

Abnormally shallow snowpacks cover interior Alaska. In contrast, coastal areas in south central are near normal, while heavy snowpacks in the southeast portion of the state have been greatly reduced at low elevations by recent warm weather.

Snow courses measured about February 1 indicate snowfall has been one-half to two-thirds of the last ten-year average in the Tanana, Copper, and Upper Susitna drainages.

Volcanic outbursts by St. Augustine turned the white snow a brown color as 1/8 inch of ash fell over the Kenai Peninsula.



EXPLANATION of STREAMFLOW FORECASTS

All flows are observed flows except as adjusted for: 1/ Storage change in Lake Sherburne. 2/ Storage change in Lima and Clark Canyon reservoirs. 3/ Storage change in Hebgen Lake. 4/ Storage change in Gibson Reservoir and measured diversions. 5/ Storage change in Two Medicine, Four Horns, Lake Francis and Swift reservoirs. 6/ Storage change in Canyon Ferry and Tiber reservoirs. 7/ Changes as indicated in (6/), (8/), plus storage change in Fort Peck. 8/ Storage change in Boysen, Buffalo Bill, Bull Lake and Yellowtail reservoirs. 9/ Storage change in Buffalo Bill Reservoir plus Heart Mountain diversion. 10/ Storage change in Pilot Butte and Bull Lake reservoirs plus Wyoming canal diversion.

11/ Changes indicated in (10/) plus storage change in Boysen Reservoir. 12/ Plus diversions to Cache LaPoudre. 13/ Plus by-pass to power plants. 14/ Minus diversion thru Gumlick Tunnel. 15/ Storage change in Price Reservoir. 16/ Minus diversions from North Platte, Laramie and Colorado rivers plus measured diversions above station. 17/ Storage change in Clear Creek, Twin Lakes and Turquoise reservoirs minus diversions from Colorado River. 18/ Storage change in Rio Grande, Santa Maria and Continental reservoirs. 19/ Storage change in El Vado and Abiquiu reservoirs. 20/ Storage change in Platoro Reservoir.

21/ Storage change in Grandby Reservoir as furnished by U.S.B.R. plus diversions by Adams Tunnel and Grand River Ditch. 22/ Changes as indicated in (21/) plus diversions thru Roberts, Gumlick and Moffat tunnels and storage change in Dillon, Homestake, Williams Fork, Green Mountain and Willow Creek reservoirs. 23/ Changes indicated in (22/) and (26/). 24/ Storage change in Blue Mesa Reservoir. 25/ Changes indicated in (24/), (30/) and (35/) and storage change in Lake Powell. 26/ Diversions to Arkansas River plus storage change in Ruedi Reservoir. 27/ (Inflow record as computed by U. S. Bureau of Reclamation.) 28/ Storage change in Taylor, Blue Mesa and Morrow Point reservoirs. 29/ Storage change in Fontenelle Reservoir. 30/ Storage change in Flaming Gorge Reservoir.

31/ Plus diversion through Duchesne Tunnel. 32/ Storage change in Moon Lake Reservoir. 33/ Storage change in Scofield Reservoir. 34/ Storage change in Joe's Valley Reservoir. 35/ Storage change in Navajo Reservoir. 36/ Plus U. P. & L. Co. tailrace and Logan, Hyde Park and Smithfield canals. 37/ Minus diversions thru Duchesne Tunnel and Weber-Provo Canal. 38/ Storage change in Lake Tahoe and Boca reservoirs (Forecast by Truckee Basin Committee.) 39/ Storage change in Bridgeport Reservoir. 40/ Corrected for major upstream impairments -- represents simulated natural flow conditions.

41/ Storage change in Priest Lake. 42/ Storage change in Coeur d'Alene Lake and diversions by Spokane Valley Farms Co. and Rathrums Prairie canals. 43/ Storage change in Lake Chelan. 44/ Storage change in Jackson Lake. 45/ Storage change in Jackson Lake and Palisade reservoirs. 46/ Storage change in Jackson Lake, Palisades, Island Park, Henry's Lake, Grassy Lake plus diversions between Heise and Blackfoot. 47/ Storage change in Henry's Lake and Island Park reservoirs. 48/ Storage change in MacKay Reservoir and diversion in Sharp Ditch. 49/ Combined flow Big Wood near Bellevue and Camas Creek near Blaine. 50/ Storage change in Arrowrock, Anderson Ranch and Lucky Peak reservoirs.

51/ Storage change in Wild Horse Reservoir. 52/ Storage change in Cascade and Deadwood reservoirs. 53/ Storage change in Keechelus, Kachess and CleElum reservoirs plus diversion by Kittitas Canal. 54/ Changes indicated in (52/) plus storage change in Bumping and Rimrock Lakes plus diversion by Roza, Union Gap, New Reservation, Old Reservation and Sunrise canals. 55/ Storage change in Bumping and Rimrock Lakes and diversions by Tieton, Selah Valley, Wapatox canals and City of Yakima. 56/ Storage change in Merwin, Yale and Swift reservoirs. 57/ Storage change in Mayfield Reservoir.

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